DOCUMENT RESUME

ED 432 477 SE 062 748

AUTHOR	Rapoport, Alan I.
TITLE	Does the Educational Debt Burden of Science and Engineering Doctorates Differ by Race/Ethnicity and Sex? SRS Issue Brief.
INSTITUTION	National Science Foundation, Arlington, VA. Div. of Science Resources Studies.
REPORT NO	NSF-99-341
PUB DATE	1999-04-16
NOTE	6p.
AVAILABLE FROM	National Science Foundation, 4201 Wilson Blvd., Suite 965, Arlington, VA 22230; Tel: 301-947-2722; TTD: 703-306-0090; Web site: http://www.nsf.gov/sbe/srs/; e-mail: pubs@nsf.gov
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Debt (Financial); *Doctoral Degrees; Engineering; *Federal Aid; *Financial Problems; Financial Support; Graduate Study; Higher Education; *Postdoctoral Education; Science Education

ABSTRACT

An issue often arising in discussions about government support for graduate education in science and engineering is student indebtedness. An earlier issue brief entitled "What is the Debt Burden of New Science and Engineering Ph.D.'s?" (NSF-98-318) provided information about the debt owed by new doctorate recipients at the time of Ph.D. conferral for undergraduate and/or graduate education expenses for tuition and fees, living expenses and supplies, and transportation to and from school. This brief extends the analysis of U.S. citizens by examining the differences in debt burden among racial/ethnic groups and between men and women. (CCM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 432 477

Does the Educational Debt Burden of Science and Engieering Doctorates Differ by Race/Ethnicity and Sex

by
Alan I. Rapoport

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

SE062748

NATIONAL SCIENCE FOUNDATION
Directorate for Social, Behavioral, and Economic Sciences

DOES THE EDUCATIONAL DEBT BURDEN OF SCIENCE AND ENGINEERING DOCTORATES DIFFER BY RACE/ETHNICITY AND SEX?

by Alan I. Rapoport

Division of Science Resources Studies

ISSUE BRIEF

April 16, 1999

Underrepresented minority S&E Ph.D. recipients were more likely to be in debt and have higher levels of debt than either white or Asian doctorate recipients.

Electronic Dissemination

SRS data are available through the World Wide Web (http://www.nsf.gov/sbe/srs/). For more information about obtaining reports, contact pubs@nsf.gov or call (301) 947-2722. For NSF's Telephonic Device for the Deaf, dial (703) 306-0090.

NSF 99-341

An issue arising in discussions about government support for graduate education in science and engineering is student indebtedness. An earlier Issue Brief provided information about the debt owed by new doctorate recipients at the time of Ph.D. conferral for undergraduate and/or graduate education expenses for tuition and fees, living expenses and supplies, and transportation to and from school.[1] It highlighted differences in the debt situation of U.S. citizens and foreign Ph.D. recipients, and of science and engineering (S&E) Ph.D.s and doctorates in other (non S&E) fields. This Issue Brief extends the analysis of U.S. citizens by examining differences in debt burden among racial/ethnic groups and between men and women in S&E fields.[2]

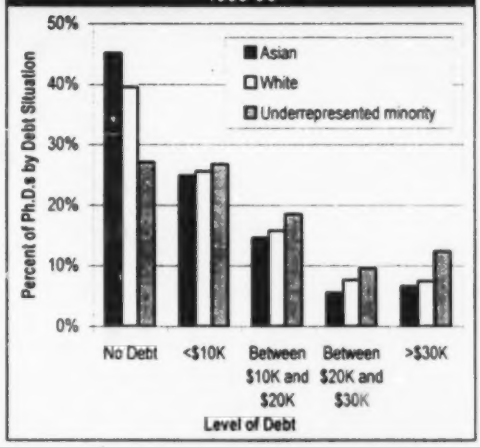
Overall, just under 40 percent of U.S. citizens who received their science and engineering (S&E)[3] Ph.D.s from 1993-96[4] reported having no debt at the time their degrees were conferred. Forty-two percent reported total debt burden of $20,000 or less (26 percent had debt up to $10,000, and 16 percent had debt between $10,000 and $20,000); 8 percent reported debt levels of $20,000 to $30,000; and another 8 percent had debts exceeding that amount.[5]

However, there are significant differences between the debt situations of Asian, white, and underrepresented minority (American Indian/Alaskan Native, black, or Hispanic) S&E Ph.D. recipients. Differences are also apparent between men and women.

Differences Among Racial/Ethnic Groups

A smaller percentage of underrepresented minorities were debt free compared to whites or Asians. Only 27 percent of underrepresented minority S&E Ph.D. recipients reported not having any debt, compared to 40 percent of whites and 45 percent of Asians in the 1993-96 period (figure 1). In addition, underrepresented minorities reported higher levels of debt than their white and Asian counterparts. Each of the four indebtedness ranges shown in figure 1 has a larger

Figure 1. Cumulative debt related to the education of S&E doctorate recipients (U.S. citizens), by race/ethnicity and level of debt: 1993-96



NOTES: Percentages do not total to 100 due to omission of non-respondents and rounding. Underrepresented minorities include American Indians/Alaskan Natives, blacks, and Hispanics. Debt is for undergraduate and/or graduate education expenses for tuition and fees, living expenses and supplies, and transportation to and from school.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Earned Doctorates, various years, unpublished tabulations.

[1] See the Issue Brief "What is the Debt Burden of New Science and Engineering Ph.D.s?" National Science Foundation, Division of Science Resources Studies, NSF 98-318.

[2] The analysis excludes foreign Ph.D. recipients from U.S. universities.

[3] S&E includes the physical sciences, mathematical sciences, computer sciences, environmental (earth, atmospheric, and oceanographic) sciences, life sciences (including medical and health sciences), social sciences, psychology, and engineering.

[4] The choices that could be selected by respondents to characterize their debt positions have been identical since 1993. Changes were made in the survey in 1993 that do not permit comparisons of data from earlier surveys with data from the 1993-96 period. While 1997 data recently became available, this analysis focuses on the 1993-96 period to provide overlap with the previously cited Issue Brief on indebtedness.

[5] Some respondents failed to furnish this information.

percentage of underrepresented minorities than either whites or Asians. For example, 10 percent of the underrepresented minority S&E Ph.D.s reported debt between $20,000 and $30,000, compared to 8 percent of whites and 6 percent of Asians; and 12 percent of underrepresented minorities reported debt greater than $30,000, compared to only 7 percent for both whites and Asians.

Since the field distribution of S&E Ph.D. degrees varies across racial/ethnic groups, and the extent and level of indebtedness also varies by field, one may believe that the differences reported above are primarily the result of field distribution differences.[6] But that is not the case. In each of the fields presented in table 1, including those in which underrepresented minorities were

Table 1. Cumulative debt related to the education of S&E doctorate recipients (U.S. citizens), by race/ethnicity and field: 1993-96

Ph.D. field	Race/ethnicity	Number of Ph.D.s	In percents		
			No debt	<$20K	>$20K
All S&E fields	Asian	3,293	45	39	12
	White	56,630	40	41	15
	Underrepresented minority	4,239	27	45	22
Agricultural sciences	Asian	46	54	33	9
	White	1,777	40	44	11
	Underrepresented minority	97	23	47	21
Biological sciences	Asian	850	42	43	12
	White	12,134	38	46	13
	Underrepresented minority	780	27	49	18
Computer sciences	Asian	139	58	30	8
	White	1,515	55	33	8
	Underrepresented minority	67	45	36	15
Engineering	Asian	945	52	36	9
	White	7,857	50	38	8
	Underrepresented minority	482	41	43	12
Environmental sciences	Asian	29	69	24	7
	White	1,808	44	45	8
	Underrepresented minority	52	31	52	12
Mathematical sciences	Asian	94	53	36	5
	White	1,847	50	40	7
	Underrepresented minority	73	37	48	11
Medical/Health sciences	Asian	115	40	31	20
	White	3,240	49	35	12
	Underrepresented minority	314	29	41	22
Physical sciences	Asian	499	42	48	8
	White	7,462	38	50	9
	Underrepresented minority	422	32	51	12
Psychology	Asian	294	32	32	29
	White	10,822	28	34	31
	Underrepresented minority	1,131	19	40	34
Social sciences	Asian	282	39	44	15
	White	8,168	38	42	17
	Underrepresented minority	821	25	48	22

NOTES: Percentages do not total to 100 due to rounding and omission of non-respondents from table. Underrepresented minorities include American Indians/Alaskan Natives, blacks, and Hispanics. Debt is for undergraduate and/or graduate education expenses for tuition and fees, living expenses and supplies, and transportation to and from school.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Earned Doctorates, various years, unpublished tabulations.

[6] See Table 2 in "What is the Debt Burden of New Science and Engineering Ph.D.s?" National Science Foundation, Division of Science Resources Studies, NSF 98-318.

most likely to receive their Ph.D. degrees (psychology and the social sciences), a smaller percentage of underrepresented minorities reported not having any debt than either whites or Asians. In most of these fields the differences reported were substantial. In addition, in both of the debt ranges reported in the table, the percentage of underrepresented minorities reporting debt is always greater than the percentage of Asians or whites reporting debt. Differences between white and Asian S&E Ph.D. recipients are generally small compared to those between underrepresented minorities and these two groups, although Asians are generally less likely to have debt than whites.

In most S&E fields, women were less likely than men to be in debt and had smaller levels of debt after receiving their Ph.D.s.

Differences Between Women and Men

For all S&E Ph.D.s conferred to U.S. citizens between 1993-96, there was little difference between the debt situations of men and women. Thirty-nine percent of each group reported having no debt. The debt burden of women appears to be slightly higher than that for men, with 17 percent of women reporting debt greater than $20,000 compared to 14 percent of men. Among the men, 43 percent reported debt less than $20,000 compared to 39 percent of the women (table 2).

However, field-level data indicate that the aggregate findings mask substantial differences in

Table 2. Cumulative debt related to the education of S&E doctorate recipients (U.S. citizens), by sex and field: 1993-96

Ph.D. field	Sex	Number of Ph.D.s	In percents		
			No debt	<$20K	>$20K
All S&E fields	Women	25,839	39	39	17
	Men	39,078	39	43	14
Agricultural sciences	Women	513	40	42	9
	Men	1,428	39	44	13
Biological sciences	Women	6,014	41	45	10
	Men	7,898	35	46	15
Computer sciences	Women	352	53	32	9
	Men	1,404	55	32	8
Engineering	Women	1,428	51	40	6
	Men	7,992	50	38	9
Environmental sciences	Women	463	42	49	7
	Men	1,447	45	44	9
Mathematical sciences	Women	483	57	34	6
	Men	1,559	47	42	7
Medical/Health sciences	Women	2,692	50	34	11
	Men	1,019	38	37	17
Physical sciences	Women	1,885	39	49	9
	Men	6,618	38	50	9
Psychology	Women	7,873	29	33	31
	Men	4,455	22	37	33
Social sciences	Women	4,136	40	40	17
	Men	5,258	35	44	17

NOTES: Percentages do not total to 100 due to rounding and omission of non-respondents from table. Debt is for undergraduate and/or graduate education expenses for tuition and fees, living expenses and supplies, and transportation to and from school.

SOURCE: National Science Foundation, Division of Science Resources Studies, Survey of Earned Doctorates, various years, unpublished tabulations.

the debt situation between male and female S&E Ph.D. recipients. A major reason that aggregate data show similarities in the debt situation of male and female S&E Ph.D. recipients is that about 30 percent of women's S&E Ph.D.s conferred in the 1993-96 period were in psychology compared to only 11 percent of the men's. Psychology as a field has the highest percent and levels for educational debt of all S&E fields.

In all but two of the fields presented in table 2—the computer sciences and the environmental(earth, atmospheric, and oceanographic) sciences—a larger proportion of women than men reported not having any debt. In a number of these fields, the differences are substantial. For instance, in the mathematical sciences, 57 percent of women Ph.D. recipients reported having no debt compared to 47 percent of the men; in the medical/health sciences, 50 percent versus 38 percent; and in psychology, 29 percent versus 22 percent for men.

The apparent higher debt levels for women also seem to be primarily the result of aggregation (table 2). In most fields a smaller percentage of women report debt exceeding $20,000 than men; only in the computer sciences does the percentage of women with debt above $20,000 exceed that of men, albeit by a small margin. In a number of fields—agricultural sciences, biological sciences, and medical/health sciences—the differences between the percentages of women and men reporting debt greater than $20,000 are substantial.

Source

The source of data for this Issue Brief is the Survey of Earned Doctorates, an annual survey designed to obtain data on the number and characteristics of all individuals who receive research doctoral degrees from U.S. institutions, including information on indebtedness at the time of graduation for education-related expenses.

This Issue Brief was prepared by:

Alan I. Kapoport
Division of Science Resources Studies
National Science Foundation
4201 Wilson Boulevard, Suite 965
Arlington, VA 22230

703-306-1776 x7208
arapopor@nsf.gov

4321OX1013 01

NSF 99-341

MS NIQUI BECKRUM
DATABASE COORDINATOR
ERIC / CSMEE
1929 KENNY RD #200
COLUMBUS, OH 4321O 1015

RETURN THIS COVER SHEET TO ROOM P35 IF YOU DO NOT WISH TO RECEIVE THIS MATERIAL ☐ OR IF CHANGE OF ADDRESS IS NEEDED ☐ , INDICATE CHANGE INCLUDING ZIP CODE ON THE LABEL (DO NOT REMOVE LABEL).

PENALTY FOR PRIVATE USE $300
OFFICIAL BUSINESS

NATIONAL SCIENCE FOUNDATION
ARLINGTON, VA 22230

BULK RATE
POSTAGE & FEES PAID
National Science Foundation
Permit No. G-69